



MINOLTA

COLOR METER III F

☐ E INSTRUCTION MANUAL

☐ F MODE D'EMPLOI

MINOLTA COLOR METER IIIF

(English)

The Minolta Color Meter IIIF helps to ensure consistent results when taking color photographs using either ambient or flash light. It measures the light illuminating the subject and determines the filtration required to reproduce subject colors correctly. Readings are provided for both light-balancing filters (as required mired shift or Kodak Wratten filter numbers) and color-compensating filters (as density). In addition, the photographic color temperature of the illumination can also be displayed. The meter can be set to determine the required filters for any of three film types: Daylight (balanced to 5500K), Type-A Tungsten (balanced to 3400K), or Type-B Tungsten (balanced to 3200K).

Either ambient or flash measurements can be taken. Ambient measurements can be taken under illumination levels from EV3 to EV16.3 at ISO 100. Flash measurements can be taken for flash power levels corresponding to apertures (at the meter position) of from f/2.8 to f/180 (at ISO 100); they can be taken with or without a sync cord, and shutter speeds from 1/500 to 1 sec. can be selected. For flash measurements, the meter measures the mixed flash and ambient light, since this is what will actually illuminate the subject, at the selected shutter speed. After measurement, the shutter speed can be changed, effectively changing the ratio of flash to ambient light; by noting the change in required filtration, you can predict the effect on the image color. In addition, the Color Meter IIIF can subtract out the ambient light to display the results for only the light from the flash.

To allow you to adjust the meter to your color preferences, correction values can be set in any of the meter's nine memory channels. Once these values have been set, the meter will automatically adjust measurement calculations to ensure that colors are reproduced according to your expectations.

Please take a moment to read this manual before using the Color Meter IIIF for the first time, and keep it handy for future reference.

STATEMENT OF FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocated the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

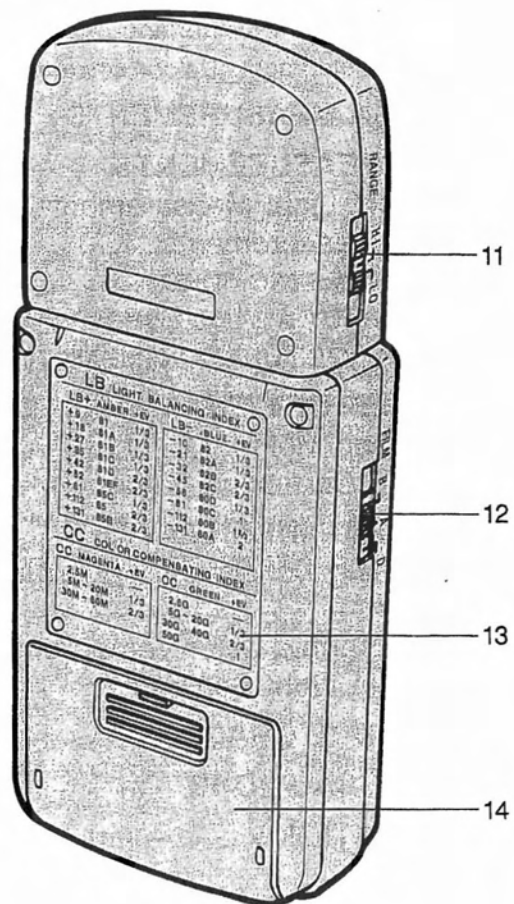
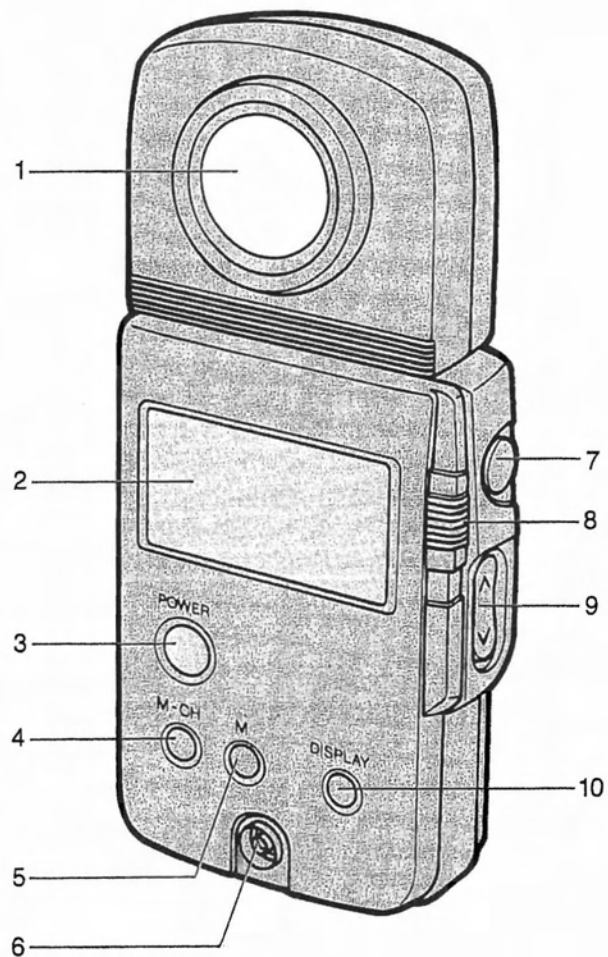
STATEMENT OF DOC COMPLIANCE

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

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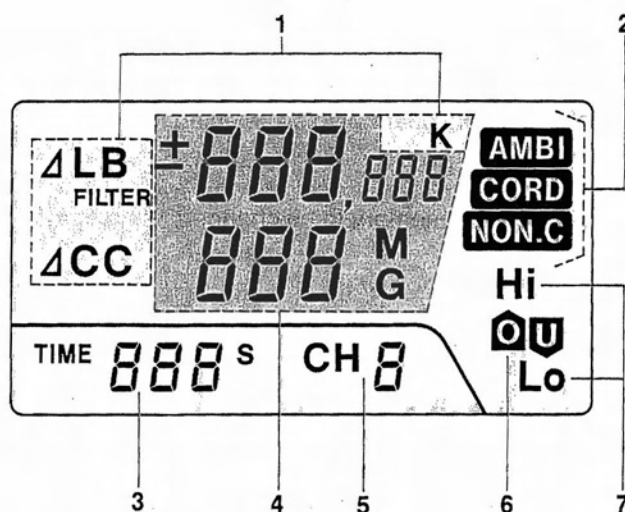
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NAMES OF PARTS



- 1 Receptor diffuser**
- 2 Data panel**
- 3 POWER button**
Switches power on and off.
- 4 Memory channel (M-CH) button**
When held pressed, allows memory channel to be selected using up/down control.
- 5 Memory (M) button**
When held pressed, allows data in memory to be changed using up/down control.
- 6 Sync terminal**
For connecting flash sync cord.
- 7 Measuring button**
Takes measurements.
- 8 Measuring-mode switch**
Selects measuring mode:
 - "AMBI": Ambient light measurements (see p. 13)
 - "CORD": Flash measurements with a sync cord (see p. 14)
 - "NON.C": Flash measurements without a sync cord (see p. 16)
- 9 Up/down control**
 - Adjusts shutter speed in "CORD" or "NON.C" measuring modes.
 - Adjusts memory channel when used with memory channel button.
 - Adjusts data in memory when used with memory button.
- 10 DISPLAY button**
Changes display mode in the following order:
... →LB/CC indexes→LB filter number/CC index→Photographic color temperature→
LB/CC indexes→...
- 11 Flash-range switch**
Selects measuring range for flash measurements:
 - Lo: f/2.8 to 22 (approx.)
 - Hi: f/22 (approx.) to 180
 - The Lo and Hi ranges overlap by approximately 1EV.
- 12 Film-type switch**
Selects film type:
 - B: Type-B tungsten film balanced for 3200K
 - A: Type-A tungsten film balanced for 3400K
 - D: Daylight film balanced for 5500K
- 13 Filter tables**
- 14 Battery-chamber cover**

DATA PANEL



1 Display-mode indications

2 Measuring-mode indications

Indicate selected measuring mode.

3 "TIME" display (Not displayed in "AMBI" measuring mode)

Indicates shutter speed for flash measurements in fractions of a second (for 1 second, value is followed by "S"); "F" indicates flash analyze function (see p. 18).

4 Measured values/stored correction value

5 Memory-channel display (Not displayed if memory channel 0 selected)

Indicates selected memory channel.

6 Over-/Under-range indications

⏏ indicates measurement is over the measuring or display range.

⏏ indicates measurement is under the measuring or display range.

7 Flash-range indications (Not displayed in "AMBI" measuring mode)

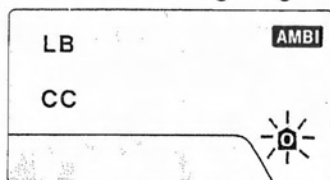
Indicates selected flash measuring range.

Over-/Under-Range Indications

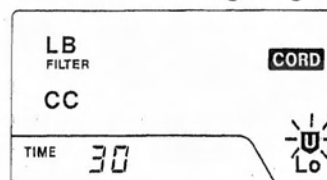
OVER/UNDER MEASURING RANGE

The meter's measuring range is EV3 to EV16.3 in AMBI measuring mode and f/2.8 to f/180 (at the meter position) in CORD or NON.C measuring mode. If the illuminance is over or under this range, **O** or **U** will blink respectively (Display-mode indications will not blink).

Over measuring range



Under measuring range



- If **O** blinks:
In AMBI measuring mode, move away from the light source and take another measurement.
In CORD or NON.C measuring mode with the flash-range switch set to **Lo**, set the flash-range switch to **Hi** and take another measurement.
If the indication continues to blink, move away from the flash and take another measurement.
- If **U** blinks:
In AMBI measuring mode, move closer to the light source and take another measurement.
In CORD or NON.C measuring mode with the flash-range switch set to **Hi**, set the flash-range switch to **Lo** and take another measurement.
If the indication continues to blink, move closer to the flash and take another measurement.

OVER/UNDER DISPLAY RANGE

The meter's display ranges are as follows:



Photographic color temperature: 1,600 to 40,000K

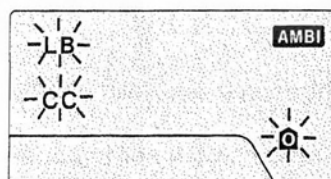
LB index: -500 to +500

CC index: 200G to 200M

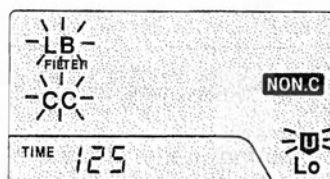
LB filter number: 80A+80D to 85B+81EF

Photographic Color Temperature, LB Index, or CC Index

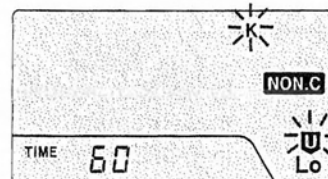
If the calculated values would be over or under the display range or ranges for photographic color temperature, LB index, and/or CC index, the display-mode indications will blink together with either  or .



LB/CC indexes



LB filter number/CC index

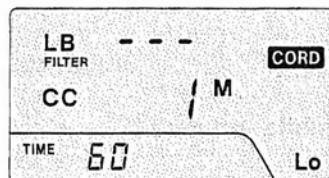


Photographic color temperature

- Measurements outside these display ranges would also be outside the more limited display range for LB filter number.

LB Filter Number

If the calculated values would be over or under the display range for LB filter number, the value for LB filter number will be as shown below.



In this case, although the LB filter number cannot be displayed, values for LB index, CC index, and photographic color temperature can be displayed by changing the display mode (see p. 10).

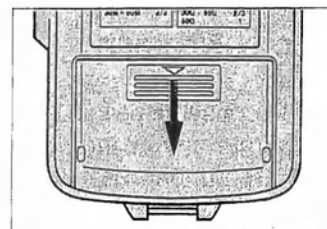
PREPARATIONS

Power

The Color Meter III F is powered by two AA-size 1.5V alkaline-manganese or carbonzinc, or 1.2V nickel-cadmium batteries.

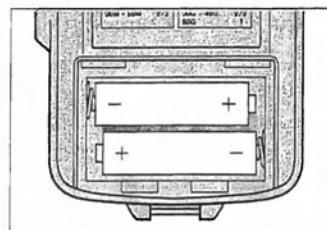
INSTALLING BATTERIES

- 1 Remove the battery-chamber cover by pressing on the cover's ridged portion and sliding it in the direction of the arrow.

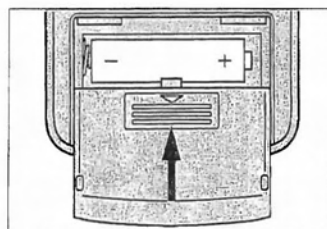


- 2 Insert the batteries with the polarities as indicated inside the battery chamber.

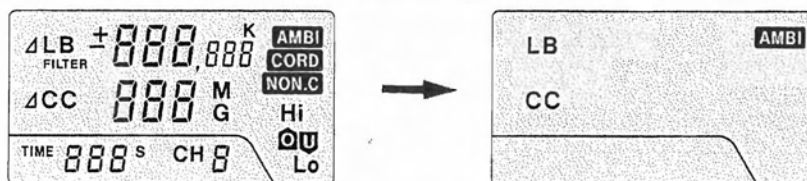
- Do not mix battery types or ages.



- 3 Replace the battery-chamber cover.



Immediately after the batteries are installed, all of the meter's displays and indications will appear for a few seconds, and then the data panel will change to one of the measurement displays.



Initial display settings:

Display mode: LB and CC indexes

Measuring mode: According to setting of measuring-mode switch

Memory channel: 0 (no memory channel number displayed)

Flash range*: According to setting of flash-range switch

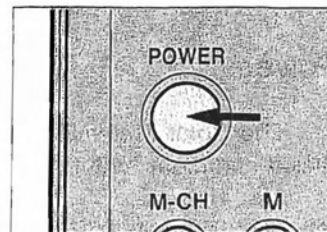
Shutter speed*: "60" (1/60 second)

*Flash range and shutter speed are not shown in AMBI measuring mode.

SWITCHING POWER ON AND OFF

To switch on the Color Meter IIIF, press the **POWER** button; the values for the last measurement will appear in the display. (If the setting of the measuring-mode switch, or of the flash-range switch in CORD or NON.C measuring mode, has been changed since the last measurement, no values will be displayed.) The meter is then ready to take measurements.

To switch off the meter, press the POWER button again.



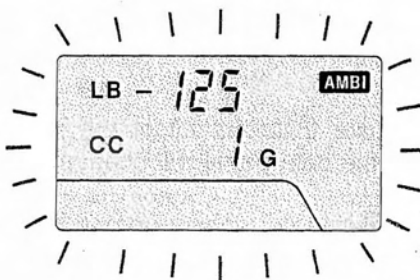
AUTO POWER OFF

To conserve power, the Color Meter IIIF automatically switches off if you do not take a measurement or operate any of the switches or buttons for four minutes. To switch the meter back on, press the **POWER** button. The display shown in the data panel just before the meter was switched off will reappear.

- If the setting of the film-type switch is different from the setting when the meter automatically switched off, the displayed values will be those for the new setting.
- If the setting of the measuring-mode switch, or of the flash-range switch in CORD or NON.C measuring mode, is different from the setting when the meter automatically switched off, no data will be shown in the data panel when the meter is switched back on.

LOW-POWER WARNING

When the power of the batteries becomes low, all displayed values and indications will blink. The meter's batteries should then be replaced with new ones.

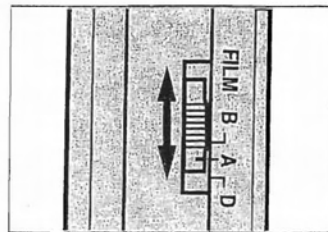


Setting Film-Type Switch

To obtain correct results, the film-type switch must be set to the position corresponding to the film to be used.

- B: Type-B tungsten films balanced for 3200K
- A: Type-A tungsten films balanced for 3400K
- D: Daylight films balanced for 5500K

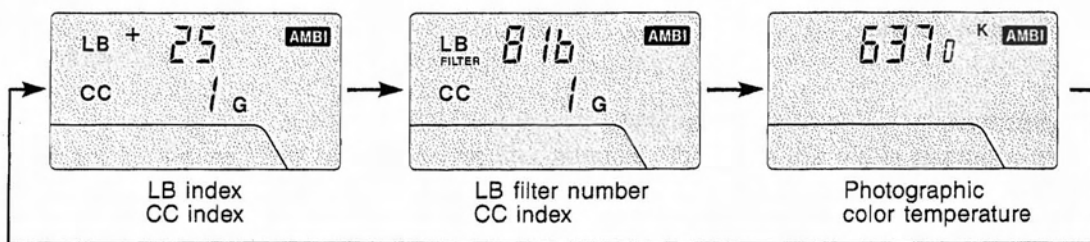
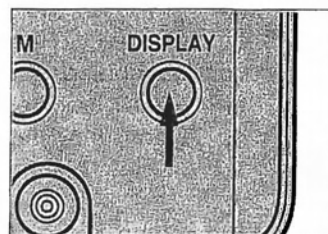
- If the setting of the film-type switch is changed after a measurement has been taken, the displayed values will be recalculated for the new setting.



Selecting Display Mode

The Color Meter IIIF offers three different display modes: LB index/CC index, LB filter number/CC index, and photographic color temperature.

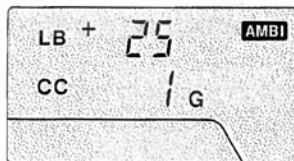
To select the desired display mode, press the **DISPLAY** button. The display mode will change in the following order each time the **DISPLAY** button is pressed.



- Displayed values will be recalculated and displayed in the new display mode when the display mode is changed.

DISPLAY MODES

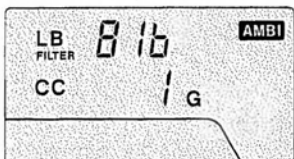
LB and CC Indexes



LB index; mired shift value of required light-balancing filter

CC index; nominal value of required color-compensating filter

LB Filter Number and CC Index



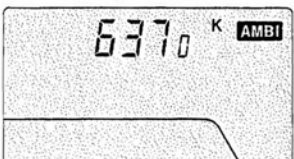
Kodak Wratten filter number *

(If two filter numbers are shown, use both filters together)

CC index; nominal value of required color-compensating filter

* For Kodak Wratten filter numbers, "b" indicates B (as in 80B), "d" indicates D (as in 80D), and "E" indicates EF (as in 81EF).

Photographic Color Temperature

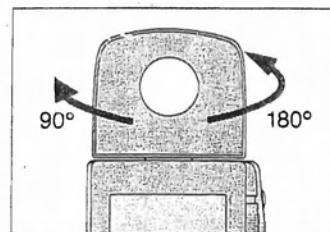


Photographic color temperature * in Kelvins

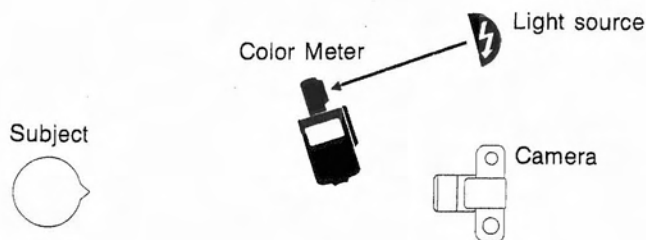
* Photographic color temperature is determined based on the spectral response of color film. See p. 25 for further information.

NOTES ON MEASUREMENTS

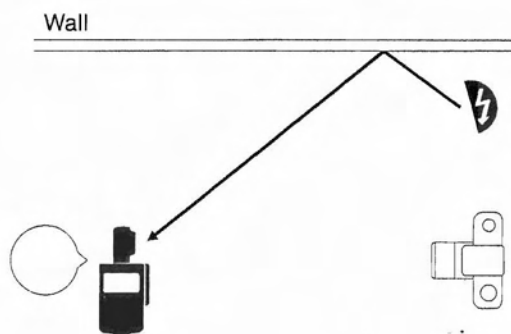
- When taking a measurement, be careful to avoid the influence of reflectance from objects, such as your body or clothes, which will not affect the light illuminating the subject.
- The receptor head can be rotated 90° to right or 180° to the left.



In general, measurements should be taken with the meter facing the light source and positioned close to the light source. This method will provide satisfactory results in many situations.



However, in some cases, the light illuminating the subject may not be the same as the light emitted by the light source. This is especially true if the subject is near an object, such as a wall, which will reflect light onto the subject; the light which illuminates the subject after being reflected by the object takes on the color of that object. In such a case, better results may be obtained if the meter is aimed either at the object or at the camera from the subject's position.



When the subject is illuminated by multiple light sources, correction can be performed in one of the following ways, depending on the particular situation.

- If the light sources will be filtered, measure each light source individually and add the filtration indicated by the meter to the light source.
- If the light sources will not be filtered but are all the same type of light source, either measure each light source individually and determine the approximate average of the meter readings, or take the measurement with the meter facing the camera from the subject position, and use the corresponding filtration over the camera lens.
- If the light sources will not be filtered and are of different types, take the measurement with the meter facing the camera from the subject position and use the corresponding filtration over the camera lens. In this case, color bracketing is also recommended.

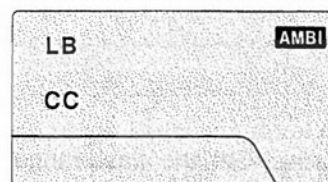
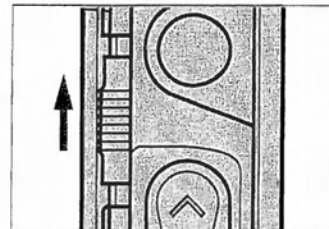
The Color Meter IIIF will provide accurate filtration recommendations based on the sensitivity corresponding to the setting of the film-type switch in most situations. However, under certain light sources, accurate results may be impossible to obtain; see p. 26 for a description of such light sources. If the results are not exactly what you would prefer, the displayed values can be adjusted to match your preferences using the meter's memory channels; see p. 19 for more information.

TAKING MEASUREMENTS

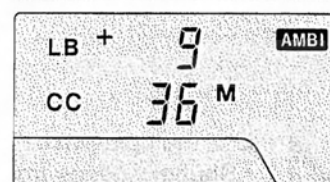
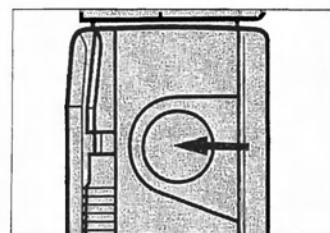
Ambient Light Measurements

1 Check that the film-type switch is at the correct position (p. 9), the desired display mode is selected (p. 10), and the desired memory channel is selected (p. 19; if no memory channel number is shown, the selected memory channel is 0).

2 Slide the measuring-mode switch up to the "AMBI" position.
• If the setting of the measuring-mode switch is changed, the previously displayed values will disappear.



3 Aim the Color Meter IIIF's receptor toward the light source and press the measuring button to take a measurement. Measurements will be taken continuously while the measuring button is held pressed; the latest measurement results will be held in the display when the measuring button is released.



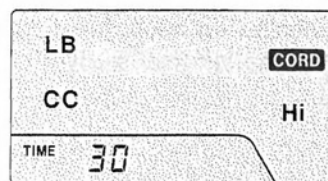
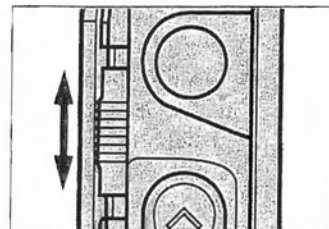
• If the over-range indication () or the under-range indication () blinks in the display, see p. 5.

Flash Measurements

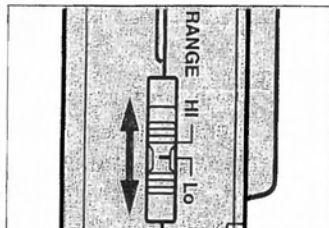
WITH A SYNC CORD

1 Check that the film-type switch is at the correct position (p. 9), the desired display mode is selected (p. 10), and the desired memory channel is selected (p. 19; if no memory channel number is shown, the selected memory channel is 0).

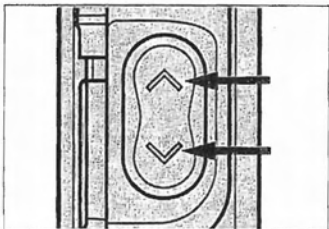
2 Slide the measuring-mode switch to the "CORD" position.
• If the setting of the measuring-mode switch is changed, the previously displayed values will disappear.



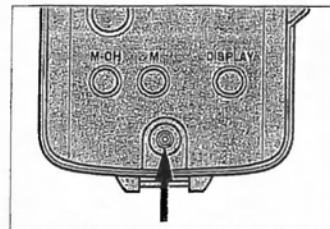
3 Set the flash-range switch according to the aperture which would be used at the meter position: For apertures from f/2.8 to f/22, set the switch to **Lo**; for apertures from f/22 to f/180, set the switch to **Hi**.



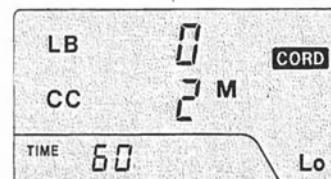
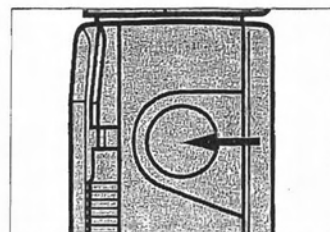
4 Use the up/down control to select the shutter speed to be used.
• Shutter speeds from 1 to 1/500 sec. can be selected in 1-stop increments.
• Be sure that the shutter speed is set within the camera's X-sync range.
• The shutter-speed setting "F", which is the setting above 1/500 sec., sets the meter to analyze mode (see p. 18).





- 5** Attach the flash sync cord to the Color Meter IIIF's sync terminal.
- The flash may fire when you attach the cord.



- 6** Aim the Color Meter IIIF's receptor toward the flash and press the measuring button; the flash will fire and a measurement will be taken.
- The trigger voltage of some electronic flash units may be too low for the Color Meter IIIF to fire them in cord mode. If this is true of your flash, use non-cord mode (see p. 16).

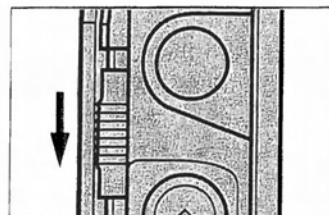


- If the over-range indication () appears in the display and the flash-range switch is set to **Lo**, set the switch to **Hi**. If the under range indication () appears and the flash-range switch is set to **Hi**, set the switch to **Lo**. If either indication reappears, see p. 5.
- If ambient light is present, the measurement results will be the filtration required for the combination of flash and ambient light. To obtain measurement results for only the light from the flash, see p. 18.
- If the shutter speed is changed after measurement, the displayed values will be automatically recalculated for the new shutter speed.

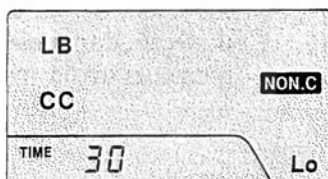
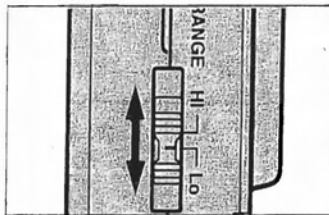
WITHOUT A SYNC CORD

1 Check that the film-type switch is at the correct position (p. 9), the desired display mode is selected (p. 10), and the desired memory channel is selected (p. 19; if no memory channel number is shown, the selected memory channel is 0).

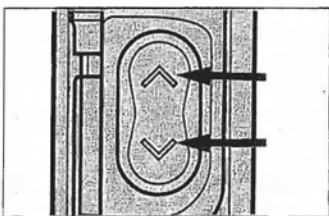
2 Slide the measuring-mode switch to the "NON.C" position.
 • If the setting of the measuring-mode switch is changed, the previously displayed values will disappear.



3 Set the flash-range switch according to the aperture which would be used at the meter position: For apertures from f/2.8 to f/22, set the switch to Lo; for apertures from f/22 to f/180, set the switch to Hi.

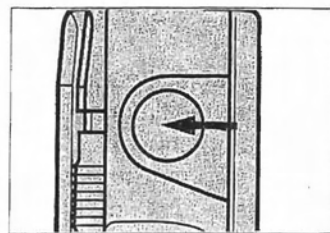


4 Use the up/down control to select the shutter speed to be used.
 • Shutter speeds from 1 to 1/500 sec. can be selected in 1-stop increments.
 • Be sure that the shutter speed is set within the camera's X-sync range.
 • The shutter-speed setting "F", which is the setting above 1/500 sec., sets the meter to analyze mode (see p. 18).

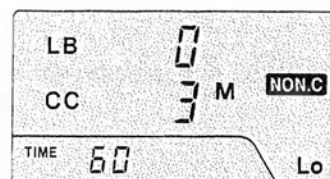




5 Press the measuring button. "NON.C" will start blinking, indicating that the Color Meter IIF is in stand-by mode, waiting for the flash to be fired.

- Stand-by mode will be automatically canceled after 16 seconds if no flash is fired. If the measuring button is pressed while the meter is in stand-by mode, the 16-second period will be restarted.



6 Aim the Color Meter IIF's receptor toward the flash and fire the flash. The measurement will be taken when the flash is fired and stand-by mode will be canceled ("NON.C" will stop blinking).

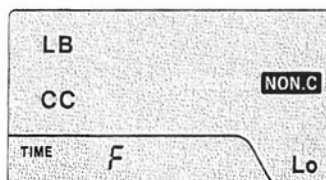


- If the over-range indication () appears in the display and the flash-range switch is set to **Lo**, set the switch to **Hi**. If the under range indication () appears and the flash-range switch is set to **Hi**, set the switch to **Lo**. If either indication reappears, see p. 5.
- If ambient light is present, the measurement results will be the filtration required for the combination of flash and ambient light. To obtain measurement results for only the light from the flash, see p. 18.
- If the shutter speed is changed after measurement, the displayed values will be automatically recalculated for the new shutter speed.

ANALYZE FUNCTION: MEASURING ONLY FLASH IN MIXED LIGHTING

By using the Color Meter IIIF's analyze mode, the photographic color temperature of only the light from the flash or the filtration required for the flash alone can be determined without the influence of the ambient light.

To take measurements in analyze mode, follow the procedure for flash measurements with a sync cord (see p. 14) or without a sync cord (see p. 16), but set the shutter speed to "F" (the setting above 1/500 sec.). The effective shutter speed when "F" is set is 1/15 sec.



USING MEMORY CHANNELS TO ADJUST METER READINGS

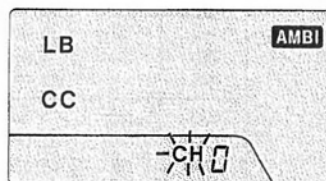
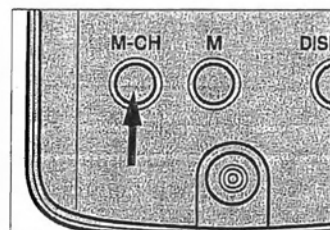
The filtration values determined by the Color Meter IIIF are intended to be suitable for as wide a variety of films as possible. However, photographs taken using the unadjusted meter readings may not reproduce scene colors exactly as they are or as you would prefer. The Color Meter IIIF has nine memory channels in which you can store values to adjust the meter readings to your preferences. Correction values for LB index and CC index can be input separately, and the stored correction values are used for all film-type settings.

- The Color Meter IIIF has ten memory channels in total; however, values in memory channel 0 cannot be changed.
- Correction values in all channels are set to 0 at the time of shipment.

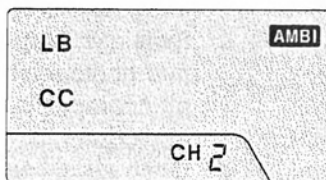
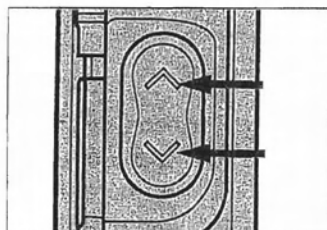
Selecting Memory Channel

1 Set the display mode to LB/CC indexes or LB filter number/CC index by pressing the **DISPLAY** button (p.10).

2 Press and hold the memory-channel (**M-CH**) button. "CH" will blink in the display and the presently selected memory channel number will be shown.



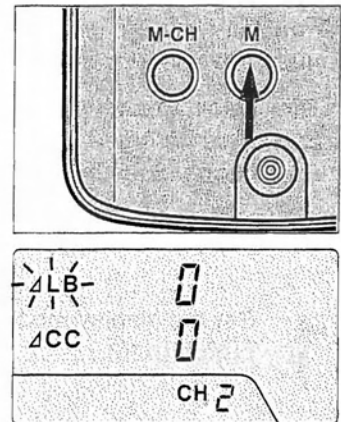
3 While continuing to hold the memory-channel button pressed, use the up/down control to select the desired memory channel number.



Setting Correction Values

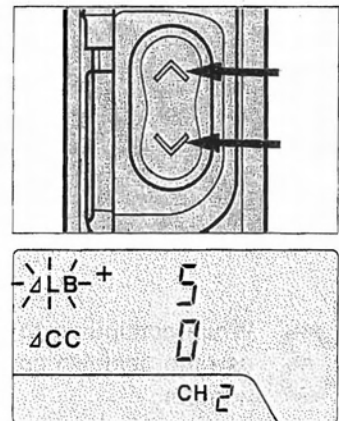
- 1 Select the memory channel to set correction values in (p.19).
 • Correction values cannot be set in memory channel 0.

- 2 Press and hold the memory (M) button. Either " ΔLB " or " ΔCC " will blink in the display to indicate which value can be changed.



- To change the value which is not presently blinking, release the memory button, and then press it again.

- 3 While continuing to hold the memory button pressed, use the up/down control to set the correction value.
 • Correction values will be added to the initial measurement results to obtain the displayed measurement results.



- Correction values can be determined as follows:
 - a Measure a test scene using the Color Meter IIIF set to memory channel 0 (no correction) and note the measurement results.
 - b Take a series of color-bracketed test photographs, with the measurement results obtained in (a) as the center of the color brackets.
 - c Evaluate the photographs and select the one with the best color. The filtration used for this photograph will then be used to determine the correction value. (If none of the test photographs have exactly the right color, repeat (b) with the filtration used for the best photograph as the center of the color bracket.)
 - d Once an acceptable test photograph has been obtained, the LB correction value can be determined by subtracting the LB index measured in (a) from the mired shift value of the filtration used for the test photograph. The CC correction value should be adjusted repeatedly until measurements under the conditions in (a) give values corresponding to the CC filtration used for the test photograph.

4 Repeat steps 2 and 3 if necessary to set the other correction value for the selected memory channel.

- The meter's case has a memo holder in which you can put a card listing the correction values in each memory channel or what conditions (film type, light source, etc.) each channel has been set for.

FOR OWNERS OF THE COLOR METER II

If you have been using the Color Meter II's VARI. setting and setting a photographic color temperature, you can achieve the same effect by using the memory functions of the Color Meter IIIF and inputting the ΔLB correction value corresponding to the photographic temperature you set, as listed in the tables below.

For film-type settings A and B:

Desired photographic color temperature		Corresponding ΔLB correction value	
K	Mired	Type B	Type A
2800	357.14	+45	+63
2820	354.61	+42	+60
2840	352.11	+40	+58
2860	349.65	+37	+56
2880	347.22	+35	+53
2900	344.83	+32	+51
2920	342.47	+30	+48
2940	340.14	+28	+46
2960	337.84	+25	+44
2980	335.57	+23	+41
3000	333.33	+21	+39
3020	331.13	+19	+37
3040	328.95	+16	+35
3060	326.80	+14	+33
3080	324.68	+12	+31
3100	322.58	+10	+28
3120	320.51	+8	+26
3140	318.47	+6	+24
3160	316.46	+4	+22
3180	314.17	+2	+20

Desired photographic color temperature		Corresponding ΔLB correction value	
K	Mired	Type B	Type A
3200	312.50	0	+18
3220	310.56	-2	+16
3240	308.64	-4	+15
3260	306.75	-6	+13
3280	304.88	-8	+11
3300	303.03	-9	+9
3320	301.20	-11	+7
3340	299.40	-13	+5
3360	297.62	-15	+4
3380	295.86	-17	+2
3400	294.12	-18	0
3420	292.40	-20	-2
3440	290.70	-22	-3
3460	289.02	-23	-5
3480	287.36	-25	-7
3500	285.71	-27	-8
3520	284.09	-28	-10
3540	282.49	-30	-12
3560	280.90	-32	-13
3580	279.33	-33	-15

Desired photographic color temperature		Corresponding ΔLB correction value	
K	Mired	Type B	Type A
3600	277.78	-35	-16
3620	276.24	-36	-18
3640	274.73	-38	-19
3660	273.22	-39	-21
3680	271.74	-41	-22
3700	270.27	-42	-24
3720	268.82	-44	-25
3740	267.38	-45	-27
3760	265.96	-47	-28
3780	264.55	-48	-30
3800	263.16	-49	-31
3820	261.78	-51	-32
3840	260.42	-52	-34
3860	259.07	-53	-35
3880	257.73	-55	-36
3900	256.41	-56	-38
3920	255.10	-57	-39
3940	253.81	-59	-40
3960	252.53	-60	-42
3980	251.26	-61	-43

For film-type setting D:

Desired photographic color temperature		Corresponding ΔLB correction value
K	Mired	Type D
5000	200.00	+18
5050	198.02	+16
5100	196.08	+14
5150	194.17	+12
5200	192.31	+10
5250	190.48	+9
5300	188.68	+7
5350	186.92	+5
5400	185.19	+3
5450	183.49	+2
5500	181.82	0
5550	180.18	-2
5600	178.57	-3
5650	176.99	-5
5700	175.43	-6
5750	173.91	-8
5800	172.41	-9
5850	170.94	-11
5900	169.49	-12
5950	168.07	-14

Desired photographic color temperature		Corresponding ΔLB correction value
K	Mired	Type D
6000	166.67	-15
6050	165.29	-17
6100	163.93	-18
6150	162.60	-19
6200	161.29	-21
6250	160.00	-22
6300	158.73	-23
6350	157.48	-24
6400	156.25	-26
6500	153.85	-28
6600	151.52	-30
6700	149.25	-33
6800	147.06	-35
6900	144.93	-37
7000	142.86	-39

Values not listed in either of the sets of tables can be calculated using the following equation:

$$\Delta LB = \frac{10^6}{T_2} - \frac{10^6}{T_1}$$

where:

T_1 = 5500K (Film type D),
3400K (Film type A), or
3200K (Film type B)
 T_2 = Desired photographic color temperature

NOTE:

Some further adjustments from the listed or calculated values may be necessary depending on the exact sensitivity of the meter cells.

ADDITIONAL INFORMATION

Obtaining Consistently Good Image Color

A color image and how it is perceived by the viewer is the final result of the interaction of various factors, including film, lighting conditions, processing, and viewing conditions. These factors can be considered as the parts of an overall system; to obtain consistently good image color, all parts of the system must be kept consistent. To do this, follow the steps below.

- 1 Purchase a quantity of film from the same emulsion batch and store the film under optimum conditions until use.
- 2 Find a high-quality processing lab that produces consistent results and use only this lab for processing.
- 3 Balance your viewing system to photographic daylight (5500K) and check it periodically.
 - Because the spectral sensitivity of the Color Meter IIIF corresponds to the sensitivity of photographic film and not to the spectral sensitivity of the eyes, it is not recommended for use in balancing your viewing system. For such purpose, a colorimeter with spectral sensitivity closely matching that of the eyes (such as the Minolta Chroma Meter CL-100) should be used. Further, since photographic color temperature alone is insufficient to exactly specify a color, it is recommended that the viewing system be balanced using the x and y chromaticity coordinates of the standard illuminant corresponding to 5500K. These coordinates are 0.332, 0.348.

The above three steps, together with using the Color Meter IIIF to control the color of the lighting, will provide consistent results. However, the resulting color may be somewhat different from the color results you would like. If this is the case, the system should be fine-tuned by adjusting the correction values in the memory channels of the Color Meter IIIF according to the procedure on p. 19.

Filters

The Color Meter IIIF provides readings for two types of filters: LB (light-balancing) filters and CC (color-compensating) filters.

Light-balancing filters are used to increase or reduce the color temperature of light. The amount by which the filter changes the color temperature is usually specified as the mired (micro-reciprocal degree) shift of the filter. The LB index provided by the Color Meter IIIF is the mired shift value of the required filter. Positive (+) mired shifts decrease the color temperature of the light, making it more yellow; negative (-) mired shifts increase the color temperature, making it more blue.

The filter corresponding to a displayed LB index can be found by referring to the table on the back of the Color Meter IIIF, which lists Kodak Wratten filters corresponding to LB index values, or to a chart included with filters. Remember that filters can be combined if necessary to obtain the required mired shift. For example, for an LB index of +149, you could use an 85B filter (mired shift value: +131) together with an 81A filter (mired shift value: +18).

The Color Meter IIIF can also provide direct readout of Kodak Wratten filter numbers, for both light-balancing (81 and 82 series) and conversion (80 and 85 series) filters. The 81 and 82 series Kodak filters provide minor shifts in color temperature; the 80 and 85 series provide much larger shifts. When more than one filter must be used to obtain the required mired shift, the Color Meter IIIF displays both filter numbers. The table below shows the relation between the LB index and the LB filter number displayed.

LB Index and Corresponding LB Filter Number

LB index	Filter number	LB index	Filter number
< -193	---	+14 to +22	81A
-192 to -182	80A + 80D	+23 to +30	81B
-181 to -170	80A + 82C	+31 to +38	81C
-169 to -158	80A + 82B	+39 to +46	81D
-157 to -147	80A + 82A	+47 to +56	81EF
-146 to -137	80A + 82	+57 to +65	81EF + 81
-136 to -127	80A	+66 to +75	81EF + 81A
-126 to -118	80B + 82	+76 to +85	85C
-117 to -108	80B	+86 to +94	85C + 81
-107 to -97	80C + 82A	+95 to +103	85C + 81A
-96 to -87	80C + 82	+104 to +109	85C + 81B
-86 to -80	80C	+110 to +116	85
-79 to -72	80D + 82A	+117 to +125	85 + 81
-71 to -62	80D + 82	+126 to +135	85B
-61 to -51	80D	+136 to +144	85B + 81
-50 to -39	82C	+145 to +153	85B + 81A
-38 to -27	82B	+154 to +161	85B + 81B
-26 to -16	82A	+162 to +169	85B + 81C
-15 to -6	82	+170 to +177	85B + 81D
-5 to +4	0	+178 to +188	85B + 81EF
+5 to +13	81	> +189	---

Color-compensating filters adjust the quantity of only a single quantity of light, such as red, blue, or green. The CC index provided by the Color Meter IIIF indicates the nominal density of the green (G) or magenta (M) CC filter required. Both of these filters adjust the quantity of green in the illumination; since magenta is the complementary color of green, it can be thought of as "minus green". Indications for other CC filters are unnecessary, since the light-balancing filters adjust the quantities of red and blue in the illumination. CC filters are specified by their nominal density; for example, a CC05G filter would be a green filter with a nominal density of 0.05.

Filters can be placed either in front of the light source, or behind or in front of the camera lens.

Light-source filters affect only the light from the source they're placed in front of; thus, they can be used to balance the light from several sources to a single value. In addition, since they are not in the optical path between the subject and the film, they do not affect the image quality at all; also, exposure compensation is not necessary, even when using a handheld meter. However, they can be tedious to work with when using multiple light sources; in addition, the range of filters available is not as wide as that of lens filters.

Lens filters may be somewhat easier to use. However, since they are between the subject and the film, they must be of higher optical quality. All lens filters must be handled carefully and kept clean, since scratches, fingerprints, dust, etc. on the filter will degrade the image. In addition, the color dye in lens filters may reduce the image sharpness, especially for filters with high density; for this reason, combining more than two or three lens filters is usually not recommended. Lens filters affect the overall color of the entire scene; when several sources are used, a compromise filtration pack must be determined if the color output by all sources is not the same.

Exposure compensation must also be considered when using lens filters. If exposure is determined using a handheld meter, the exposure compensation for the lens filter or filters being used must be calculated and the exposure adjusted accordingly; when using a camera's TTL (through-the-lens) meter, this is not necessary. Exposure compensation is usually listed in the literature accompanying the filter; the table on the back of the Color Meter IIIF also lists compensation (+EV) values for LB and CC filters. When using more than one filter, the required exposure compensation is the sum of the compensations for each filter. For example, when using an 82B filter (compensation: +2/3EV) together with a CC10M filter (compensation: +1/3EV), the total required exposure compensation would be +1EV.

Occasionally, both light-source and lens filters must be used together. This is particularly true when using different types of light sources. In this case, light-source filters are used to balance all of the light sources to a single value; lens filters are then used to correct that value for the film being used.

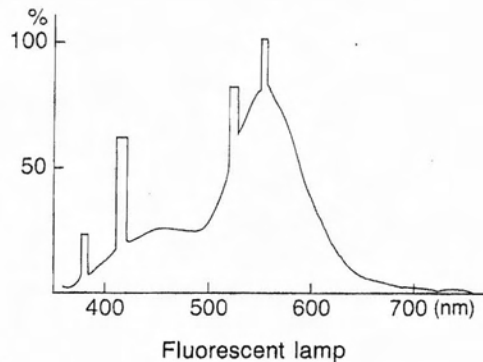
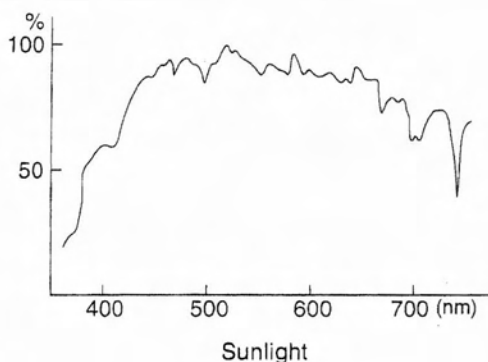
Photographic Color Temperature

The Color Meter IIF determines the photographic color temperature according to the ratio between the intensity of light in the blue region and that in the red region of the spectrum; the resulting value is referred to as "photographic color temperature", since it is determined based on the characteristics of color film. Higher B/R ratios result in higher photographic color temperatures. However, this method assumes that the spectral power distribution of the light source is continuous with no sharp peaks, such as those of sunlight and many tungsten lamps.

Although the Color Meter IIF can provide color-temperature readings for light sources with spectral power distributions which are not continuous or which contain sharp peaks (such as those of fluorescent lamps), such readings will not necessarily be accurate and may not provide an accurate indication of how photographic film will respond to such sources. Thus, color-temperature measurements of such sources are not recommended.

- "Photographic color temperature" is different than the "color temperature" used in physics and colorimetry. Basically, color temperature as used in physics and colorimetry refers to the temperature at which an ideal blackbody would emit light of the same color (having the same chromaticity) as that of the light being measured.

Spectral power distributions

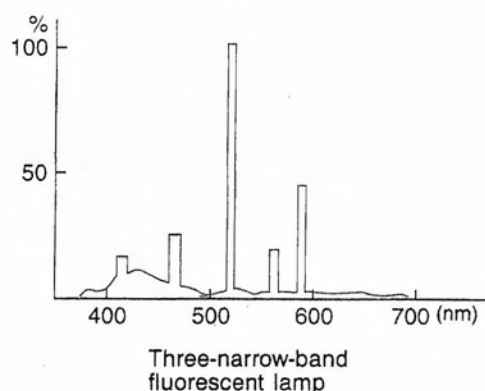
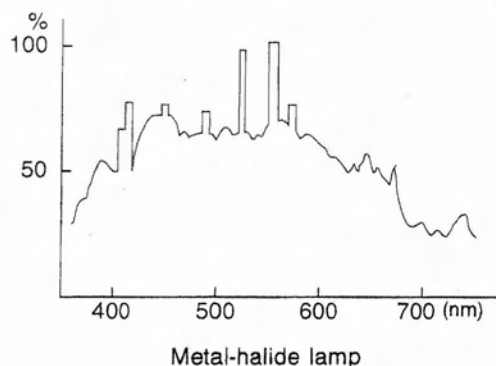


Problem Light Sources

The Color Meter IIF uses three sensors (one each for red, green, and blue) to measure the light from the source and determine the filtration required. It will provide accurate results for a variety of common light sources. However, problems may occur with light sources with sharp peaks (or line spectra) in their spectral power distributions. Such light sources include sodium lamps, mercury lamps, metal-halide lamps, and some fluorescent lamps, such as the three-narrow-band lamps.

If photographs will be taken under such light sources, it is recommended that test photographs be taken and color bracketing be performed. If there is a difference between the displayed filter value and the actual required filtration, this difference will generally be the same for all lamps of this type, and can thus be stored in one of the memory channels for later use. Please remember, however, that it may not be possible to accurately reproduce all colors under such light sources, regardless of the filters used.

Spectral power distributions



CARE AND STORAGE

- Do not press on or damage the data panel.
- Do not subject the meter to shock or vibration.
- This meter should be used at temperatures between -10 and 50°C (14 and 122°F). Operation at temperatures outside this range may be unsatisfactory.
- This meter should never be placed or left in the glove compartment or other places in a motor vehicle, or in other locations where it may be subject to temperatures higher than 55°C (131°F) or lower than -20°C (-4°F), as it may be permanently damaged. Particular care should be taken not to leave the meter in direct sunlight or near sources of heat such as strong lights, etc. Do not store this meter in humid places or near corrosive chemicals.
- If the meter is left or placed in direct sunlight for any long period, the data panel may turn black.
- When the meter is to be stored, place it in its original packing and put it in an airtight container with an appropriate amount of dehumidifying agent, such as silica gel.
- Never attempt to disassemble the meter. Any necessary repairs should be performed only by an authorized Minolta service facility.
- The meter body may be wiped with a silicone-treated cloth to clean it. Do not allow alcohol or chemicals of any other kind to touch its surface.
- Never lubricate any part of the meter.

BATTERY CAUTIONS

Improper handling of batteries may result in explosion, burn, or heat generation.

- Do not attempt to disassemble, recharge, or short out the battery, or subject it to high temperatures or fire.
- Never use batteries that show signs of leaking or cracking.
- When inserting batteries, make sure the + and – terminals face in the correct direction.
- Don't mix batteries of different types, ages or brands.
- For extended storage, remove the batteries. Otherwise, leaking or gas generation may occur.
- Read and follow all warnings and instructions supplied by the battery manufacturer.

SPECIFICATIONS

Type:	Three-color digital color meter for color photograph; determines filtration required and photographic color temperature of light sources		
Receptor head:	Rotating (90° to right/180° to left) receptor head containing three silicon photocells (filtered to red, green, and blue sensitivities appropriate for color photography)		
Film-type settings:	D: Daylight film balanced to 5500K A: Type-A Tungsten film balanced to 3400K B: Type-B Tungsten film balanced to 3200K		
Measuring modes:	Ambient (AMBI); flash (CORD, NON.C)		
Measuring range (ISO 100):	Ambient:	EV3 to 16.3	
	Flash:	f/2.8 to 180 (in two ranges)	
Shutter-speed setting range (for flash measurements):	1 to 1/500 sec. in 1-stop increments		
Display:	Liquid crystal (LCD)		
Display modes:	LB index and CC index; LB filter number and CC index; photographic color temperature		
Display range:	LB index:	-500 to 500 mireds	
	CC index:	200G to 200M	
	LB filter number:	80A+80D to 85B+81EF	
	Photographic color temperature:	1600 to 40,000K	
Analyze function:	Determines measurement values for only flash light in mixed flash/ambient situations		
Memory function:	9 memory channels for storing correction values to adjust calculated filtration (LB index and CC index); stored values automatically added to initially calculated values before display of results Correction-value range: ΔLB: -100 to +100 mireds ΔCC: 100G to 100M		
Repeatability:	LB index:	2 mireds	
	CC index:	2 digits	
	Photographic color temperature:	Corresponding to 2 mireds (Based on Minolta's standard test method)	

Power source:	2 AA-size batteries
Dimensions:	160 × 68 × 28mm (6-1/4 × 2-11/16 × 1-1/8 in.)
Weight (without batteries):	200g (7.1 oz.)
Standard accessories:	Case; strap



MINOLTA